

## CLAIMS

We claim:

1. A multiple-input queuing system comprising:

a buffer that includes a plurality of memory-elements,

an allocator that is configured to allocate a memory-element of the plurality of memory-elements for storing a data-item from a select input-stream of a plurality of input-streams, and

a mapper that is configured to:

receive a request) for an output corresponding to the select input-stream,

determine an address associated with the memory-element, based on the request

for the select input-stream, and

provide the data-item from the memory-element as the output, based on the address associated with the memory-element.

2. The multiple-input queuing system of claim 1, further including

a first switch, operably coupled to the allocator, that is configured to route the data-item from the select input-stream to the memory-element.

3. The multiple-input queuing system of claim 2, further including

a second switch, operably coupled to the mapper, that is configured to route the data-item from the memory-element to the output.

4. The multiple-input queuing system of claim 1, wherein

the allocator is further configured to allocate the memory-element based on a request from the select input-stream for an allocation.

5. The multiple-input queuing system of claim 4, wherein

the allocator is further configured to:

receive allocation requests from other input-streams of the plurality of input-streams,

determine a relative priority of the allocation requests from the other input-streams and the request from the select input-stream, and

identify the select input-stream, based on the relative priority.

6. The multiple-input queuing system of claim 4, wherein

the allocator is further configured to:

receive allocation requests from other input-streams of the plurality of input-streams, and

allocate other memory-elements of the plurality of memory-elements for storing other data-items from the other input-streams.

7. The multiple-input queuing system of claim 6, wherein

the allocator is configured to allocate the other memory-elements contemporaneously with allocating the memory-element for storing the data-item from the select input-stream.

8. The multiple-input queuing system of claim 6, wherein

the mapper that is further configured to:

receive requests for outputs corresponding to the other input-streams,

determine addresses associated with the other memory-elements, based on the request for the other input-streams, and

provide the other data-items from the other memory-element as outputs from the multiple-input queuing system, based on the addresses associated with the other memory-element.

9. A buffer system that is configured to receive data from a plurality of input-streams, the buffer system comprising:

a plurality of memory-elements,

a plurality of input-multiplexers, each input-multiplexer being coupled to a memory-element of the plurality of memory-elements, and

an allocator, operably coupled to the plurality of memory-elements, that is configured to couple one or more input-streams of the plurality of input-streams to corresponding one or more memory-elements, via allocation commands to the plurality of input-multiplexers.

10. The buffer system of claim 9, further including:

a mapper, operably coupled to the allocator, that includes:

a memory that is configured to store information corresponding to the allocation commands, and

a multiplexer, operably coupled to the memory, that is configured to access the information corresponding to the allocation commands, and to thereby provide an identification of the one or more memory-elements corresponding to a select input-stream of the plurality of input-streams, and

an output-multiplexer, operably coupled to the plurality of memory-elements and to the mapper, that is configured to couple a select memory-element of the plurality of memory-elements to an output of the buffer system, based on the identification of the one or more memory-elements corresponding to the select input-stream.

11. The buffer system of claim 10, wherein

the memory of the mapper includes

a plurality of queues, each queue of the plurality of queues corresponding to each input-stream of the plurality of input-streams.

12. A method of buffering data-items from a plurality of input-streams, including:

receiving an input-notification from one or more input-streams of the plurality of input-streams,

allocating a select memory-element of a plurality of memory-elements to a select input-stream of the one or more input-streams,

storing a received data-item from the select input-stream to the select memory-element,

storing an identification of the select memory-element corresponding to the select input-stream,

receiving an unload request) that identifies the select input-stream, and

providing the received data-item from the select memory-element, based on an identification of the select memory-element corresponding to the select input-stream.

13. The method of claim 12, further including

allocating a plurality of select memory-elements of the plurality of memory-elements to a plurality of select input-streams of the one or more input-streams,

storing a received data-item from each of the plurality of select input-streams to a corresponding each of the plurality of select memory-elements, and

storing an identification of each of the plurality of select memory-elements corresponding to each of the plurality of select input-streams.

14. The method of claim 12, wherein:

storing the identification of the select memory-element includes

placing the identification in a first-in-first-out queue that is associated with the select input-stream, and

providing the received data-item includes

removing the identification from the first-in-first-out queue that is associated with the select input-stream.

15. The method of claim 12, wherein:

each memory-element of the plurality of memory-elements is dynamically classifiable as currently-used and currently-unused;

allocating the select memory-element includes:

5 identifying one of the plurality of memory-elements that is classified as currently-unused as the select memory-element, and

classifying the select memory-element as currently-used; and

providing the received data-item includes

classifying the select memory-element as currently-unused.

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